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Information and Data Management Study

Final Report

Phase II

Planning and Coordination

Preliminary Draft

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Draft Report

Site Survey and Analysis Phase

Information and Data Management Study

for the

Bureau of Land Management

United States Department of Interior

Contract Number 08-550-CT4-14

Prepared by the

Strategic Plan Study Team

BLM-Denver

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1.0 INTRODUCTION

This is the Phase II Report "Site Survey and Analysis," for the Bureau of Land Management "Information and Data Management Study." It is the second of five reports which, together with the "BLM Strategic Information Plan," are the final products of this study.

The five phases are:

Phase I	Planning and Coordination
Phase II	Site Survey and Analysis
Phase III	Data/Technology Survey and Analysis
Phase IV	System Recommendations
Phase V	Plan Formulation

The purpose of this study is to develop a strategic plan to apply appropriate Automatic Data Processing and Remote Sensing system technologies to the needs of the Bureau of Land Management on an evolutionary basis, while at the same time, solving the problems associated with data/information and process deficiencies that may exist within BLM.

The remainder of this report is organized as follows:

Section 2	"Site Survey" describes the procedure used in the survey of the sites.

Section 3 "Data Reduction" describes the procedure used to summarize and consolidate the comments received.

Section 4 "Data Analysis" describes the analysis procedure used to match the comments to BLM functions.

Section 5 "Miscellaneous" - describes several independent, but related efforts undertaken by the study team.

Section 6 "Project Workbook" - describes the contents of this document which contains all significant results from Phase II of the project.

The objectives of the "Site Survey and Analysis" phase of the project was to:

- o conduct the site survey tour as planned in Phase I.
- o sort and analyze the information received from the site survey.
- o determine site priorities.
- o identify existing BLM equipment and software.
- o identify and catalog existing BLM processes.
- o estimate survey results to all applicable sites.
- o identify site data needs and deficiencies.
- o identify site process needs and deficiencies.
- o define the Bureau's long-term goal.

During this phase these objectives were met with the following exceptions:

- Determination of site priorities

  In most cases the site manager stated that priorities are determined by law and upper level management direction and was reluctant to volunteer his evaluations.
- Estimate survey results to all applicable sites
- Define the Bureau's long-term goal

  This task was not completed by the Study Team since it was felt that definition of long-term goals sould be defined by the Bureau Steering Committee. Investigation was conducted to gather facts which would assist the Steering Committee in the determination of these goals. One effort was to list present and anticipated state and Federal legislation and the second to list Bureau policy statements in which automatic data processing is either specifically referenced or implied. High priority programs foreseen for the next several years were identified through the BLM budget personnel in the Washington office.

The significant results from the Phase II tasks were documented and presented to the BLM Steering Committee for Information Systems in the form of a Project Workbook.

2.0 SITE SURVEY

2.1 SURVEY OF BUREAU OF LAND MANAGEMENT OFFICES

The overriding considerations for the demeanor of the site interviews were:

- To not bias or lead the interviewees.
- To obtain a catalog of data processing needs and deficiencies.
- To specifically identify needs for processes and data.
- To allow the user of data and data processes a significant opportunity to comment on present deficiencies and conceptual development of future systems.

Site survey techniques were standardized in the questionnaire design stage and during the pilot survey stage.

Site surveys were conducted according to the format laid out in the questionnaire for state offices, district offices, OCS offices, Eastern States Office, Denver Service Center and Boise Interagency Fire Center. Because the Washington Office required a large number of interviews within the headquarters complex as opposed to one interview at subordinate offices, the Washington format was somewhat different than the field office interviews.

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2.1.1 Preliminary Notification

A preliminary notification, in the form of an Instruction Memo, was issued notifying the selected field offices of the organization of the IBM-BLM teams and approximate times of site surveys. The next contact was made by telephone by the team members who were to make the site survey. The times of the site survey were finalized and arrangements were made at this time for a meeting place, required equipment, and the type of personnel to attend. This also offered the site an opportunity to have any questions they may have concerning the project and/or visit answered.

2.1.2 Site Visit

In accordance with the experience of the pilot surveys, we were correct in estimating that each office interview would take about two days. The survey meetings were convened at the predetermined time and place. A general introduction was given explaining the purposes of the study and the relationship of the IBM-BLM team and the general thrust of their effort under the project.

Generally, the interviews went as is discussed in the Pilot Survey-Section I. It was explained that we needed to know what the major jobs of the office were. A list was made of these jobs. The interviewer

working with the group then took each job and discussed it in terms of information and processes needed detailing areas of deficiencies.

One team member conducted the interview recording keywords of what was said on a flip chart. This technique proved useful in reducing misunderstanding between the study team member and the interviewee's intent. The other member made detailed notes and assisted in the discussion.

After all listed jobs were covered (generally at the end of the first day) the interviewers used a blank JAM chart to categorize comments. For instance, all comments referring to processes or data concerned with vegetation were grouped under vegetation.

All comments were placed under their specific categories and the interviewer returned to the group reiterating the group's comments to them for accuracy and to make sure all major workloads had been discussed. This usually started the morning of the second day.

A discussion of sample sizes (loading) was accomplished as is described in the Pilot Survey Section.

After this was done, a data processing equipment inventory for the office was accomplished along with a discussion and inventory of remote sensing equipment and use.

If discussion could be enhanced by the collection of hard copy examples, these were listed during discussion and collected before leaving the office. A total of 119 examples were collected.

2.1.3 Site Visitation Trip Report

After the interview was completed, a trip report was written for each site surveyed in a standard format as specified in Figure 2-1.

The Introduction section of the trip report makes record of the visit and iterates the unique characteristics of the site being visited such as jurisdictional area, number of planning units, number of personnel, etc.

The executive summary portion of the report is to provide a resume of the highlights of the interview concerned as it pertained to data, systems needs and deficiencies.

Major jobs of the district are recorded, along with their priority if volunteered, under Section III of the report. This section was also used to tie problems and comments made to Work Job Codes.

Section IV records the information needs and deficiencies and provides the recording mechanism for the major data received in the site interview.

OUTLINE FOR TRIP REPORT

I. Introduction
   Purpose, place, dates, attendees, site characteristics, coverage, number planning units, number employees, number overlays for URA

II. Executive summary

III. Major jobs
   Jobs, priorities (most important job), percent of workload

IV. Information needs and deficiencies
   List jam and summarize discussion listing information needs and deficiencies

V. Other comments on desirable and needed items
   Comments on items presently used and liked

VI. Suggested uses of ADP/RS

VII. Loading

VIII. Equipment inventory and uses (including remote sensing)

IX. List of examples collected and where stored

Figure 2-1

All comments were recorded by data category taken from the Job Activity Matrix which was filled in during the site interview. This section was the substance of the report and furnished the raw data for the Study Team's data reduction and analysis effort.

Section V contains comments on desirable and needed items. These comments vary from minor complaints to useful suggestions which highlight the interviewed office's more important points and state their future plans. The section also includes comments that did not fit well in the information needs and deficiencies section.

Section VI contains the interviewed office's suggested uses of ADP/RS. This information came voluntarily from the interviewees and pertained to their thoughts on how ADP/RS could be effectively used by BLM.

Section VII was used to show the amount of information an office felt it needed to do an effective job in the various resource disciplines.

Section VIII was used to list the various types remote sensing, data transmission and storage of ADP related, equipment the office owned, leased or had access to and how the equipment was used.

The last section, Section IX, contains a list of information forms or reports used by the office of any samples that were obtained during the interview and brought back to Denver.

After writing the trip report for each office, a copy was returned to that office for verification and concurrence. Comments or changes were accepted and incorporated into the report. The trip reports, site worksheets and examples collected in their final form were separated by office visited and placed in notebooks which were stored at Denver for future reference.

2.1.4 Summary

In almost all cases the personnel at the interview site were very cooperative and eager to assist. The consumption of almost 2 full days of a good portion of office staffs for the interviews was evidence of this cooperation and the teams tried to minimize the time that office participants were away from their regular work.

The site survey schedule was carried out in a timely manner and was substantially completed between August 26 and October 11, 1974. This completion was as planned. Followup on completed trip reports lasted several days.

Approximately 600 BLM personnel from the various offices visited, participated in the site survey phase. It is felt that the comments received, therefore, represent a very good cross section of BLM personnel, jobs functions, and problems since the survey covered the entire organizational

hierarchy, from resource areas to the Washington headquarters.

It must be mentioned that as part of the DSC Division and Staff interviews, a third refinement of the data category menus was accomplished. Although this effort was more complete so far as data elements for activities is concerned, some duplication of elements between activities were introduced into data categories. The menus provided the basis for defining logical records and estimating logical record lengths. This is an important factor in sizing automated data storage requirements. It is felt these menus are a good starting place for designers and resource technicians when system design is initiated.

2.2 SURVEY OF OTHER FEDERAL AGENCIES

In addition to the survey of BLM offices, an additional effort was undertaken; that of interviewing other federal agencies in the Denver, Colorado area. The purpose of the visits were to:

- o determine what information is available at these agencies that would be of use to BLM.
- o identify any ADP equipment which might be available for BLM use or possible transfer.
- o identify ADP procedures and programming systems in use.
- o inquire as to problems and successes in ADP application and implementation techniques.

A list of 10 agencies was compiled which employed ADP systems. The list was compiled from known ADP users and by telephone contact and discussions with the agencies. The agencies visited were:

U. S. Forest Service	Denver, Colorado
National Park Service	Denver, Colorado
Environmental Protection Agency	Denver, Colorado
National Oceanic and Atmospheric Administration	Boulder, Colorado
Bureau of Reclamation	Denver, Colorado
U. S. Geological Survey	Denver, Colorado
U. S. Department of Agriculture	Ft. Collins, Colorado
U. S. International Biological Program	Ft. Collins, Colorado
Federal Aviation Administration	Longmont, Colorado

In addition, a telephone discussion was held with the NASA Marshall Space Flight Center-Mississippi Test Facility, Bay Saint Louis, Mississippi. Noteworthy findings resulting from these contacts are:

- with the exception of the NASA-Mississippi facility, the ADP systems appear to be subscribed at near capacity or plan to be so in the forseeable future.
- intensive user involvement is mandatory during systems design, systems development and systems implementation to insure successful operation. Six of the 10 offices contacted volunteered this input without prompting. Specific systems were mentioned that were unsuccessful because of the lack of this input.

- o the Environmental Protection Agency has water and air quality data which could be useful to BLM. This data can be secured in the form of digital computer tapes.
- o a list of computer programs either in use or owned by the agencies visited is contained in Figure 2-2.

Several agencies referred the interviewers to their respective headquarters, most of which are located in Washington, D.C., to ascertain more detailed information regarding their information systems. This could not be accomplished within the time and resource constraints of this study project, but is recommended prior to finalization of a BLM detailed system design.

AGENCY	SYSTEM	USE
U. S. Forest Service	INFORM	
	GIM (General Information Management)	Resource Management
	GELO (Geographic Location)	Graphic Display
	FAMULUS	
National Park System	A resource base inventory system is in conceptual stage	
Environmental Protection Agency	STORET	Water Quality System
	SAROAD	Air Quality System
	Library Reference System	Library Reference
National Oceanic and Atmospheric Administration	ENDEX	Data file that lists information on data they gather.
	OASIS	Bibliographic references and abstracts
Bureau of Reclamation	MARS	Data Base Management System presently for all practical purposes not used.
	BRECS	A record of computer systems.

OTHER AGENCY INFORMATION SYSTEMS

Figure 2-2

3.0 SITE DATA REDUCTION

The site survey produced an abundant collection of information and process needs and deficiencies. The results of the analysis of this information was organized and maintained in a Project Workbook. As was expected, many of the comments from the various offices were the same or similar so it was necessary to aggregate similar statements within the defined categories, always insuring that all comments received were accounted for. This procedure involved the participation of the full Study Team for three (3) days. The final list of problem statements and matrices from that effort has provided a versatile tool for the continuing analysis of Bureau needs, priorities and concerns.

The site survey trip reports were used as working documents to extract and compile the problem statements since these reflected the actual comments of the office personnel. The trip reports were prepared in a standard format by all teams. The approach employed was to convene as a group and to list a one sentence problem statement based on a comment from a particular trip report. A discrete number was assigned to the statement along with a P to signify a process related problem or a D to signify a data related problem. The problem statement was listed under one of the 17 categories of the Job Activity Matrix (JAM) chart to categorize it by type. Each team member would then review his trip reports and assign that problem statement number and letter to each comment that represented the problem statement. Some judgment was exercised in combining comments,

however great care was exercised to insure that the fidelity of the comments was retained.

During this procedure it was discovered that the Administrative and the Managerial JAM categories included too broad a classification and so they were subdivided. The Administrative category was subdivided into nine (9) logical subcategories; these were: Fire, Personnel, Organization, Training, Payroll, Supply/Property, Reports Management, Forms Management and Files Management. The Managerial category was subdivided into five (5) categories which are Annual Work Plan, Programs, Manpower, Policy and Miscellaneous.

This listing and categorization process was followed until a total of 1288 separate data and process deficiency comments were identified.

3.1 COMMENTS SUMMARY SHEETS

In addition to compiling a list of problem statements, it was necessary to have a means of determining which problem statements applied to what offices to assist in establishing priorities. A matrix form was devised and completed called a Comment Matrix Summary Chart was then refined by combining similar offices (one for all district offices, one for all state offices, etc.). This information was further summarized on the Comments Summary Sheet which is divided by category and contains the

problem statement number and the number of times each problem statement was mentioned at each type office. The Comments Summary Sheet was then incorporated into the Project Workbook.

3.2 CLASSIFICATION OF PROBLEM STATEMENTS

The next step was to review the problem statements and to segregate them as to those that:

- o are solvable by Automatic Data Processing
- o require BLM action and then probably would be ADP solvable
- o are BLM policy comments
- o identify research needs
- o refer to current ADP systems in use by BLM
- o not worthy of any further consideration

This was accomplished in a team meeting so that the judgment, knowledge and experience of all IBM and BLM personnel could be channeled into the segregation process. Listed below is the number of statements by category:

ADP Solvable/BLM Action	1071
Research Needs	100
Policy Items	100

Current ADP systems	109
No Further Consideration	17

A discussion on each category follows with the exception of the "No Further Consideration."

3.2.1 ADP Solvable Comments

These were the most important comments since they will be carried over to the Data Analysis portion of Phase II. There were 1,071 problem statements in this category representing 2,199 site comments. Figure 3-1, Distribution of Site Comments and Problem Statements, shows the distribution of problem statements and site comments by JAM category and by process or data deficiency.

3.2.2 Research Needs

Comments specifying a requirement for basic research numbered 100. The questionnaires and techniques used during the site survey did not contain specific inquiries on research needs so the information should be regarded as unsolicited and incomplete. The study team did not attempt to verify or validate these comments, however, they were reviewed by the Denver Service Center research panel. The tabulation of the number of comments received by broad function are:

o	Planning-Programming-Budgeting	3
o	Utilizations (permits, sites, leases, etc.)	30
o	Environmental	34
o	Protection	4
o	Inventory	26
o	Personnel	3

A detailed report on research needs was prepared and delivered to the BLM Project Manager and no further action taken by the study team since these items were not within the scope of this study. In addition, a copy of the report is included in the Project Workbook, which was submitted to the BLM Steering Committee for Information Systems.

3.2.3 Policy Comments

The number of comments received related to Bureau policy numbered 100. Again, it should be kept in mind that these comments were completely spontaneous and unsolicited and no judgment has been made as to the validity of these comments. The tabulation of the comments received by broad function areas follows:

o	Planning-Programming-Budgeting	12
o	Utilization (sales, permits, leases, etc.)	35
o	Environmental	7

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CATEGORY	Number of Problem Statements			Number of Site Comments		
	Total	Data	Process	Total	Data	Process
VEGETATION	50	22	28	124	78	46
SOIL	18	10	8	62	47	15
MINERALS	25	10	15	80	44	36
GEOLOGIC	19	16	3	65	57	8
WATER	27	18	9	93	68	25
WILDLIFE	33	19	14	101	75	26
METEROLOGIC	20	11	9	53	25	28
TRANSPORTATION/RIGHTS-OF-WAY	30	8	22	70	31	39
RECREATION	51	20	31	100	59	41
SURVEY CONTROL	28	18	10	59	41	18
LAND RECORDS	30	6	24	61	11	50
SOCIO-DEMOGRAPHIC	33	16	17	84	30	54
ECONOMIC	43	29	14	87	61	26
CULTURAL	62	46	16	93	66	27
USE AUTHORIZATION	108	24	84	223	52	171
ADMINISTRATIVE						
FIRE	48	12	36	68	15	53
PERSONNEL	47	14	33	81	29	52
ORGANIZATION	10	1	9	12	1	11
TRAINING	39	7	32	68	9	59
PAYROLL	9	7	2	9	7	2
SUPPLY/PROPERTY	35	5	30	45	8	37
REPORTS MANAGEMENT	74	15	59	127	30	97
FORMS MANAGEMENT	12	2	10	16	3	13
FILES MANAGEMENT	17	1	16	23	1	22
MANAGERIAL						
ANNUAL WORK PLAN	39	2	37	79	2	77
PROGRAMS	70	4	66	177	11	166
MANPOWER	44	--	44	68	--	68
POLICY	27	--	27	35	--	35
MISCELLANEOUS	23	1	22	36	1	35
Totals	1071	344	727	2199	862	1337

DISTRIBUTION OF ADP SOLVABLE SITE COMMENTS AND PROBLEM STATEMENTS

Figure 3-1

o	Protection	8
o	Inventory	5
o	Support and Engineering	3
o	Income	8
o	Personnel	8
o	Property Management	3
o	Miscellaneous	11

A detailed report on policy comments was prepared and delivered to the BLM project manager, in addition, a copy of the report is filed in the Project Workbook which was submitted to the BLM Steering Committee for Information Systems. No further action was taken since these items were not within the scope of this project.

3.2.4 Current ADP System Comments

The comments received concerning current ADP systems were copied from the ADP Solvable Comments, categorized by ADP application system and forwarded to the Division of Data Processing at the Denver Service Center for their information and possible utilization. In addition, a copy of the report is filed in the Project Workbook. Of the 109 problem statements referring current to ADP applications, 14 fell into a general category and 95 were distributed among 21 specific systems. The distribution of the problem statements is shown in Figure 3-2 along with the number of site comments represented by the problem statements.

ADP SYSTEMS	NUMBER OF PROBLEM STATEMENTS	NUMBER OF SITE COMMENTS
All Systems	14	18
Budget & Finance	23	41
Fire and/or NFDR	4	10
Payroll	5	5
Motor Vehicle Inventory	3	4
Forest Inventory	3	3
Socio-Economic	7	11
Material Sales	1	2
Range Management	2	3
Aircraft Cost	2	2
Emergency Firefighters Cost	2	2
Property Management	7	14
Personnel Management	15	20
Roads and Trails	1	1
Cadastral	2	3
Land Base	4	6
Title Clearance	1	2
Mineral Leasing	1	1
CRIS	1	11
Watershed	2	2
JDR	8	16
Lease Management	1	1
Total	109	168

SUMMARY OF CURRENT ADP APPLICATION SYSTEM
PROBLEM STATEMENTS AND SITE COMMENTS Figure 3-2

4.0 DATA COMPILATION AND ANALYSIS

The initial attempt involved in this task was to match each problem statement to a BLM Work Job Code as described during the site interview. This revealed that a single problem statement could and in many cases did apply to several Work Job Codes. Examination of the number of Work Job Codes applying to one comment resulted in the following conclusions:

- That many Work Job Codes for BLM tasks require similar or identical inputs, processes and result in similar outputs.
- That the diagramming of inputs, processes and outputs for all Work Job Codes would be impractical.

As a result, the next logical step was to determine if certain mechanical tasks (functions) performed by the Bureau could be grouped. An example of this reasoning is that no matter what resource is being sold, i.e., grass, timber or coal, there are certain processes such as appraisal, lease or permit adjudication, billings, etc., that are done for all of these. These types of functions require similar or identical inputs and processes. A discussion was held with BLM personnel experienced in the operations of the Bureau and it was found that this supposition was true. This led to the initiation of the following process.

A major point that should not be overlooked in reading the following procedure description is that a major and detailed review of BLM procedures and manuals was accomplished during Step II of the procedure, as well as intensive discussions with BLM personnel with appropriate experience.

4.1 PROCESS DESCRIPTION FOR DEFINING BLM INTEGRATED MANAGEMENT INFORMATION SYSTEM FUNCTIONS

The process described below would produce three end products: (1) hierarchical block diagram of BLM functions (2) list of functions supportable in some manner by ADP and (3) Input, Process and Output (IPO) charts for each function showing all inputs, processes and outputs described in the procedure for that function. The procedure itself was intended to provide an initial framework and baseline that was continually refined and updated so that the final product was as complete and accurate as possible.

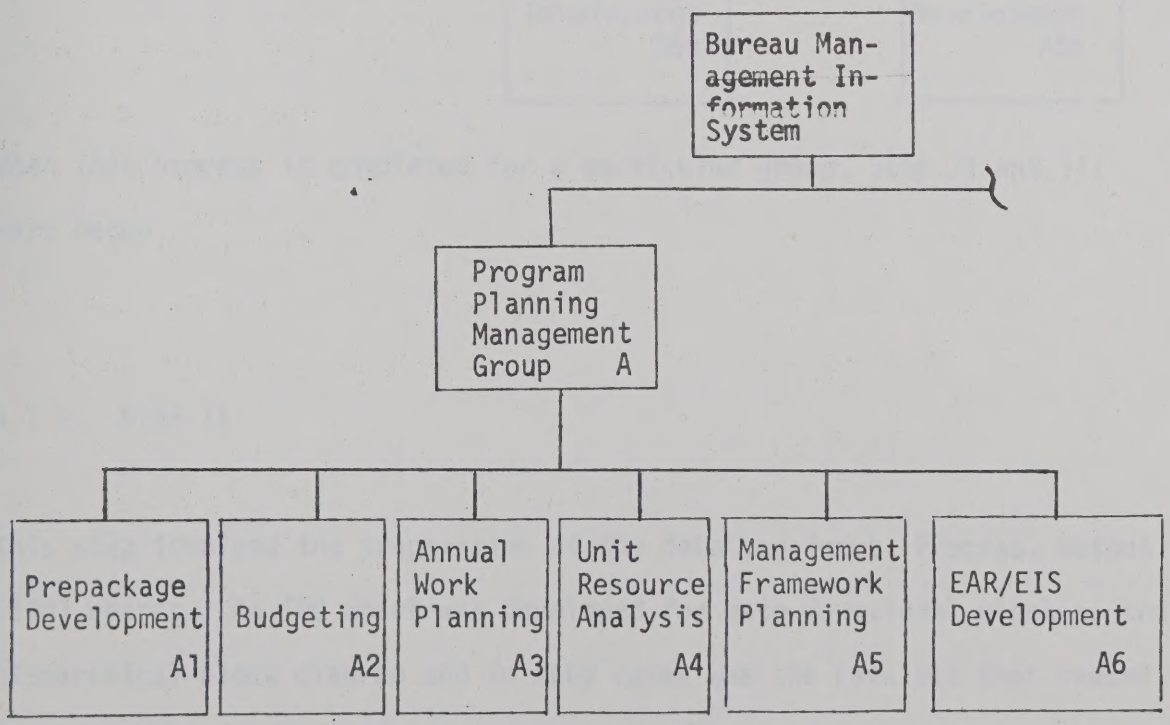
The basic process involved three steps with continuous feedback and refinement between the steps.

4.1.1 Step I

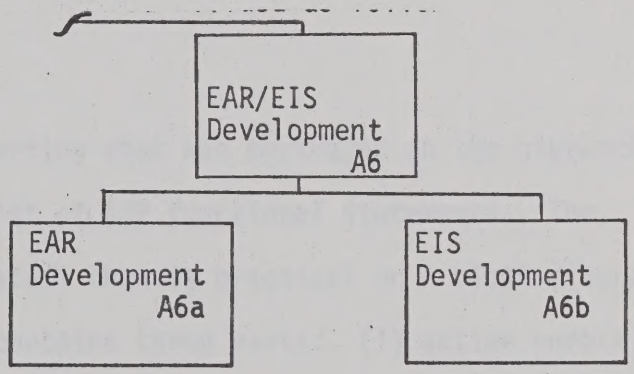
A hierarchical block diagram was created that depicts BLM functions. The

major breakout of functions involved six groupings: (1) Program Planning and Management Group (2) Land Resource Utilization and Protection Group (3) Natural Resources and Environmental Information Group (4) Land Resource Ownership and Boundary Group (5) Scientific Support and Engineering Group and (6) Advanced Administration Support Group. Each of these groups was then subdivided into the major activities or functions involved within the group. For example, the Program Planning and Management Group was broken into six groupings: (1) Prepackage Development, (2) Budgeting, (3) Annual Work Planning, (4) Unit Resource Analysis, (5) Management Framework Planning and (6) EAR/EIS Development.

The hierarchical diagram at this point looked like:



There was little concern at this point for how these things interrelated. That interrelationship was defined very specifically during Step II. The important consideration here was to identify those things that happen or get done within a grouping and to put those actions together that have similar processes associated with them. For example, EAR and EIS development were combined into the same block here in the assumption that the processes associated with each was virtually the same. At this point, that assumption was valid since if the differences between the two processes varied to a significant degree, this would show up during Step III and the block would then be subdivided as follows:



When this process is completed for a particular group, Step II and III were begun.

4.1.2 Step II

This step involved the preparation of the detailed Input, Process, Output (IPO) charts. An IPO chart was developed for each functional block on the hierarchical block diagram and in many cases was the catalyst that caused blocks to be added, combined or deleted.

The process began by copying the functional block statement at the top of a page, then making three columns titled: (1) Inputs, (2) Processes and (3) Outputs. The outputs usually were the easiest to define since they result from the function; consequently, they usually were listed first. Secondly, using whatever appropriate source; discussions with BLM personnel, BLM Procedures and Manuals; the input and process columns were filled in.

4.1.3 Step III

Step III was the process of converting what was portrayed on the hierarchical block diagram into a narrative list of ADP functional statements. The narrative format provides more detail than is practical on a block diagram. A complete functional statement contains three parts: (1) action verb(s), e.g., support, maintain, etc. (2) the object of that action, e.g., pre-packages and packages, etc., and (3) the reason, e.g., in support of the budget process, etc.

These functional statements were written for each block on the hierarchical diagram in an outline format. Under each functional statement, the processes were listed from the "Process" column of the IPO charts that had a possible ADP support solution. This composite list generally described what a possible ADP system would be required to do and the processes involved in each function to satisfy the information requirements of BLM as identified during the site survey.

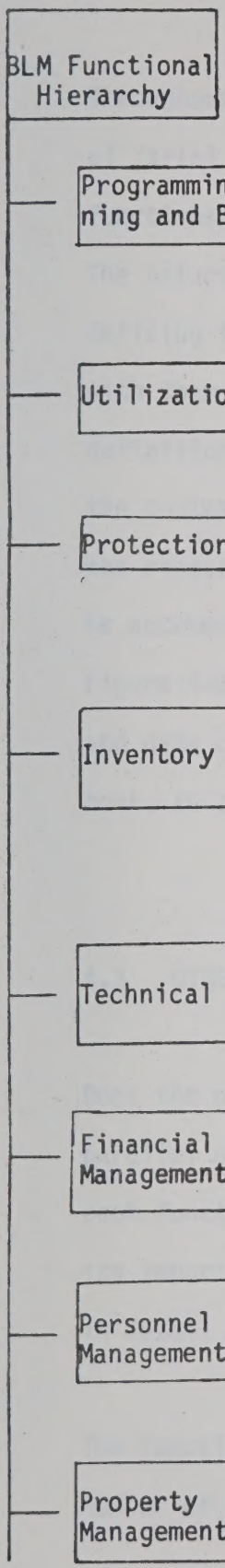
4.2 DEVELOPING-INPUT-PROCESS OUTPUT (IPO) CHARTS

The project team efforts in reviewing BLM procedures and manuals identified the data acquisition forms, manipulations and reports associated with each function and resulted in the development of 125 Input, Process and Output (IPO) charts. These charts represent in graphic form as majority of all processes used by the Bureau.

The next step was to group IPO's that represented like or similar processes. For example, the filing and pre-adjudication processes for mineral patents and oil and gas leases are very similar. They vary only in terms of the specific data handled. Once this grouping had been completed, the functional block diagram, discussed earlier, was revised to reflect the new grouping as shown in Figure 4-1. As can be seen by comparing the initial defined groups and current breakout the major functions were increased from 6 to 8. The next level of detail and subsequent level breakdowns identified a total of 127 distinct processes that were performed by BLM. The number of processes exceeds the number of IPO charts because certain processes were identified that do not exist in BLM manuals, such as remote sensing.

The next step was to write functional statements, as defined earlier, that described each process and the reason for doing it.

MAJOR BLM FUNCTIONAL AREAS



This major functional area supports BLM's Programming, Planning and Budgeting process from Unit Resource Analysis through Progress Reporting and Evaluation.

This major functional area supports land resource utilization processes including utilization initiation (filing or Bureau motion), preadjudication, management option selection, appraisal, adjudication, monitoring and evaluation.

This major functional area supports the land and resources protection process by the evaluation of alternate courses of action in prevention, presuppression and rehabilitation.

This major functional area supports the land and resource inventory process. In Card inventory and Cadastral Survey. In resource inventory it supports Planning and Preparation, Conventional Field Collection and Recording, Remotely Sensed Sollection and Recording and Preliminary Interpretation and Analysis

This major functional area supports the operational functions of BLM with technical services including Cartography and Mapping, Engineering Design, Public Participation and Records Management

This major functional area supports the managerial control of BLM's financial situation including fund control, collections, costs and payroll.

This major functional area supports BLM managerial control of their personnel related programs including Manpower Planning, Manpower Utilization, Personnel Management Evaluation, Personnel Evaluation, Personnel Records and Personnel Reports.

This major functional area supports the maintenance of current inventories of stores, equipment and real property and maintenance requirements and status.

Figure 4-1

Throughout the entire process of developing the functions, a great deal of "trial and error" was encountered in order to refine the list of functions so that it adequately reflected all processes within BLM. The nature of this refinement cycle was to use available sources for defining the functions, then to associate the comments from the survey with them. If all comments could not be accounted for in that functional definition, the functions were re-written, reorganized and refined within the context of the IPO's, then the comments again applied. This cycle was repeated until all aspects of the team's information sources could be accommodated within the functional organization and definition. Figure 4-2 shows the problem statements distributed by major functions and data category. The final organization is shown in the Project Workbook, as submitted to the Steering Committee.

4.3 OTHER EFFORTS

Once the organization and functional statements were finalized, several parallel efforts were undertaken. These efforts attempted to add to each function related factors that would give additional insight into its importance and current status within BLM. These efforts are described in detail below.

The functional statements were analyzed individually to determine the number of iterations, the current cost, and to identify gross potential

Category	Programing Planning Budget	Utili-zation	Protec-tion	Inven-tory	Tech. Support	Finance	Person-nel	Prop. Mgt.	Dupli-cates	Dis-cards	Total
Vegetation	1	8	4	32	13				9	1	50
Soils		1		17	1				1		18
Minerals	1	7	1	16							25
Geologic				17	7				5		19
Water		3		22	4				2		27
Wildlife		5		28	1				1		33
Meteorologic		2		18	5				5		20
Use Auth.	3	66	14	5	8	2		3	2	9	108
Transportation Rights-of-Way	3	7		5	13			3	2	1	30
Recreation	4	12		28	5	1	1		3	3	51
Survey Control	2	1		17	6	2					28
Land Records		13		15	2						30
Social-Demo.	24				9						33
Economic	32	9		2							43
Cultural		9		43	3		5	1		1	62
Administrative											
Fire	1		17	1	4	11	4	12	2		48
Personnel	1		1		2	1	43		1		47
Organization		1			3		1	1		4	10
Training	2				2	1	34		1	1	39
Payroll						7	2				9
Supply & Prop.	1	1				11	21			1	35
Reports Mgt.	29	3	1	1	10	12	6	6		6	74
Forms Mgt.	1	1			2		5	3			12
Files Mgt.		1			5	10				1	17
Managerial											
Annual Work Plan	36						1			2	39
Programs, Proj.	23	7		12	15	4			1	10	70
Manpower	8	14		9	5	2		2		4	44
Policy	3	9	3	1	3	2	1			5	27
Miscellaneous	1	4		1	10	2				5	23
Total	176	184	41	290	138	68	124	31	35	54	1,071

Total=Sum of Problem Statements per Functional Area-Duplicates+Discards

Figure 4-2

benefits of automating that function. Iteration is defined as the number of times a function is performed by Bureau personnel, such as Unit Resource Analysis where on the average 1.5 are completed per year per District. Current costs were estimated in terms of either man-months or dollars such as, again the case of the Unit Resource Analysis, 8-17 man-months are consumed in the preparation of a URA. Benefits of automation were described in terms of cost, output product improvement, data availability, and data accuracy such as in the case of Unit Resource Analysis, the time required to do data analysis would be significantly reduced and the availability of the finished product would be greatly increased.

Another undertaking was to document the extent to which current Automated Data Processing Systems support BLM's functional requirements. An inventory was made of current BLM application systems. Output products from those systems were analyzed to determine to which functional statement it applied. A narrative discussion was included as to how well the application system currently satisfies the requirements of that functional statement.

4.4 ADP CAPABILITY DEFINITION

The functional statements were then reviewed and a list of general capabilities noted that are required to satisfy the needs identified during the survey of BLM offices and investigation of BLM procedures. The

thoroughness of the capabilities were verified by matching each functional statement to a capability insuring that all functional statements have been accounted for. The capabilities are listed below:

- The system should provide both local and remote access to a commonly defined data base for all BLM offices for rapid and selective input, maintenance, retrieval and display of data and information.
- The system should provide for inter and intra discipline (file) collation and correlation for retrieval.
- The system should provide a generalized information retrieval and display capability (including geographic) to support standard reporting (stored) and nonstandard reporting (ad hoc) requirements at all BLM offices.
- The system should provide the capability within a single output to correlate and display multiple spatial representation (overlays), multiple tabular (file) data, or any combination of these requested by the user.
- The system should provide for automated interfaces with other government automated systems where feasible and provide translation support where required; e.g., SCS soils data, State Game and Fish for wildlife, county land records, etc.
- The system should provide the capability to process, record, retrieve and display remotely sensed data; e.g., ERTS, aerial photos, including color IR, data collection platforms, traffic counters, meteorological stations, etc.

- The system should provide the capability to accurately store and retrieve spatial and line representations of geography; e.g., land records boundaries, planning unit boundaries, habitat areas, topographical contour lines, transporation rights-of-way, rivers and streams, etc.
- The system should provide support for the entry, storage, retrieval, compilation, sectionizing, editing revision and generation of color/black and white planimetric and topographic maps, mosaics, orthophotographs, etc.
- The system should provide text display, hard copy, graphic display and/or plotted output capability; the specific capabilities and equipment configuration to be determined by the requirements of each individual office.
- The system should provide support for speculative mathematical representation and processing; e.g., EAR/EIS accumulative effect, fire war gaming, communications site selection, road design, cost/benefit trade-offs, projected supply impact and conflict determinations, etc.
- The system should provide support for factual mathematical representation and processing; e.g., area computations, trend, models, demand and needs on local, national and international level, costing of BLM projects, inflation effects, etc.
- The system should provide a security mechanism to protect the confidentiality of certain data; e.g., archeological site inventory, personnel data, etc.

- The system should provide a lock-out/protection feature to maintain the integrity of certain data (limit access for data changes to those authorized to do so), etc.
- The system should provide office-to-office communication via terminal for those information exchanges that do not require voice.
- The system should provide routing control and distribution of information/data from input office to other office(s) as appropriate for concurrence, surnaming, action, etc.
- The system should provide the capability for entry and identification of textual information and subsequent retrieval through key word retrieval techniques; e.g., instruction memoranda, legal and BLM decisions, resource study and research article abstracts, technical, historical and planning information, list of officials and correspondents, etc.
- The system should provide an interactive training support package for system/terminal operation, technical training packages, new systems and procedures, etc.
- The system should provide support for publication operations such as volume typing, editing, correcting, collating, composing, reviewing and preparation of final masters for reproduction.

5.0 MISCELLANEOUS

A follow-on activity performed by the team personnel at Denver was to:

- Compile a list of equipment owned or leased by BLM which would be of significance to the project
- Review the BLM policy statements supporting automatic data processing
- Review recent state legislation in the areas of land use planning and environmental protection
- Examine current Bureau organization structure as it may apply to an overall Bureau ADP implementation plan.

Following is a discussion of each of these activities.

5.1 EQUIPMENT REVIEW

The Bureau's Property Book was reviewed to determine what types of equipment is owned by BLM. The types of equipment cataloged were data collection, data processing, data interpreting and communications.

The Procurement Records were also reviewed to determine leased equipment. Included in the listed equipment is data collection, cameras, programmable calculators, automatic data processing equipment, transmission, and analysis evaluation equipment such as spectroscopes.

In addition to compiling a list of owned and leased equipment, the dollar values for all equipment by location was gathered. The details of this activity is contained in the Project Workbook.

5.2 BLM POLICY STATEMENTS SUPPORTING ADP

For a minimum review of the policy of BLM concerning the use of ADP, BLM Manual 1601-1603 was reviewed and pertinent policy statements concerning ADP were extracted.

These manuals on basic and supplemental guidance for the planning system offer ample indications that Bureau direction in data and information management should increase its use of ADP as a basic tool not only in the administrative and management functions but as a general tool in all Bureau functions or tasks.

Further, policy statements showing the priority for Bureau emphasis on URA and/or resource inventory and environment protection were extracted from the same manuals. Ample policy exists to show emphasis for the improvement of these functions.

Copies of these extracts are included in the project work book.

5.3 STATE LEGISLATION

State legislation in land use planning and environmental protection could have significant impacts on BLM data management systems. This could be particularly true so far as input use of other materials are concerned or standardized output which others can use. Therefore, to assess the degree of uniformity and development throughout the "BLM States" a survey of the past five years of enacted legislation and anticipated legislation was made. The survey was made by telephone contact with the Planning Chief of each of the western states. A general thrust toward environmental protection with widely varying degrees of implementation was noted. Land use planning legislation shows less progress through the legislative process.

A table was constructed that shows concern for land use planning and the environment. A copy of the table is in the project work book.

5.4 ORGANIZATION STRUCTURE

The Strategic Plan Survey Team found it necessary to examine the current Bureau organization structure alignment for management information functions to determine its adequacy in light of a Bureau system implementation.

The team concluded that the current organization will not be adequate, and most likely lead to duplication of functions. The team, therefore, developed an organizational proposal and general plan for implementation of a single manager organization for control of information systems which will provide effective, unified and integrated information functions to the Bureau. The organizational proposal and general implementation plan are contained in the project workbook.

6.0 PROJECT WORKBOOK

The final product of the "Site Survey and Analysis" phase was a Project Workbook containing all of the information gathered up to this point. The workbook is to be used as a basic document in the further phases of the study and will be invaluable if and when the detailed system design is initiated. There are four sections to the Project Workbook.

Section I of the Project Workbook contains an overall block diagram of the eight identified BLM functional requirement areas. In addition, it contains descriptions of capabilities which an automated data processing system should contain to satisfy the needs of the functions.

Section II contains the eight functional areas that embrace all of BLM's current operating procedures. The information on each functional area is subdivided into:

- a hierarchical block diagram
- a description of the benefits derived by automation
- functional statements
- associated comments from the site survey
- current ADP systems
- input-process-output charts

Section III contains the number of site comments received by site type within a function and by Work Job Code within a function.

Section IV contains miscellaneous information collected or generated during this phase of study. There are sections on:

- Research Needs
- Legislation Policy Concerns
- Capabilities vs. Functions Chart
- Equipment Inventory
- Loading Information
- Miscellaneous Comments

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